



Assessing the Knowledge and Awareness of Obstructive Sleep Apnea among Patient Families in Saudi Arabia: A Qualitative Study

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Background: Obstructive sleep apnea (OSA), if left untreated, can have major negative effects on health, such as an elevated risk of diabetes, heart disease, and stroke. Increasing people's knowledge of this illness might lessen the stigma associated with sleep problems and motivate them to get treatment if they think they might have OSA.

Aim of the Study: This study aims to assess the knowledge and awareness of OSA among patients' families in Saudi Arabia.

Methods: A phenomenological-oriented study with in-depth interviews was used to collect data from 28 participants.

Results: Two themes and subthemes emerged from the interviews, revealing significant knowledge gaps, especially regarding the health risks and management of OSA. Only a few participants were aware of the serious health implications of untreated OSA. Furthermore, many did not know about effective management strategies for OSA.

Conclusion: The level of awareness and knowledge among participants was poor, with participants' lifestyles significantly affected by having relatives with OSA. They expressed concerns about challenges with CPAP adherence and recommended various coping techniques to support affected individuals.

Keywords: obstructive sleep apnea, lifestyles, knowledge & awareness, qualitative design, snoring, health literacy

Introduction

Obstructive Sleep Apnea (OSA) is a significant global health issue, with an estimated 936 million adults aged 30–69 years affected by mild to severe OSA globally. The prevalence of OSA varies across regions, with the highest number of affected individuals in China, followed by the USA, Brazil, and India.¹ OSA can be defined as an upper airway blockage during sleep which may be categorized as partial or full.¹ The upper airways collapse during sleep due to a decrease in airway muscle tone, primarily during the inspiratory phase of breathing. This results in periodic sessions of hypopnea and or apnea. These episodes cause a decrease in arterial oxygen saturation which can result in autonomic dysregulation.^{2,3}

The risk factors for OSA can be categorized into non-modifiable and modifiable factors. Non-modifiable risk factors include age, male gender, and genetic predisposition.⁴ Modifiable risk factors include obesity, smoking, alcohol consumption, and lifestyle habits. Factors such as the distribution of body fat, the circumference of the neck, and abnormalities of the craniofacial structure also play significant roles in the development of the disorder.^{2,5–7}

OSA is associated with major neurocognitive and cardiovascular sequelae, contributing to conditions such as hypertension, heart failure, and stroke.⁸ Common and problematic symptoms of OSA include loud snoring, observed episodes of breathing cessation during sleep, abrupt awakenings accompanied by gasping or choking, excessive daytime sleepiness, and difficulty concentrating.^{2,4,6} These symptoms underscore the critical need for accurate diagnosis and effective treatment. Additionally, OSA can significantly affect cognitive function and mood, leading to issues such as



impaired memory, decreased concentration, depression, and anxiety.^{2,4,9} Effective diagnostic and treatment strategies are needed to minimize these negative health impacts.¹⁰ The economic burden of OSA is also considerable, encompassing direct medical costs and indirect costs related to lost productivity and accidents.¹¹

In US, the number of men who has been diagnosed with mild OSA is significantly increased compared to the women.^{12,13} In Europe, the prevalence of OSA in Europe is approximately third of the population.¹⁴ Globally, the prevalence of OSA in adults ranged from 9% to 38% at an AHI ≥ 5 events per hour, with higher prevalence in men and increasing with age.¹⁵ In Saudi Arabia, the prevalence of OSA is high in four out of ten middle-aged Saudi women and three out of ten middle-aged Saudi males.^{16,17}

A cross-sectional study was conducted to evaluate level of the knowledge and awareness among the people in the Al-Baha region. The authors found the level of awareness and knowledge among the target population was unsatisfactory.¹⁸ Additionally, an observational study was conducted to investigate level of awareness of OSA among parents. This study was targeting the portents who lived in Jeddah city. The authors utilized questionnaire that designed to assess four factors: knowledge about OSA, risk factors, symptoms, and treatment. Regrettably, the authors found level of knowledge among parents about OSA is poor. In fact, this outcome may delay diagnosis and treatment of OSA.¹⁹ A fascinating study was recently conducted in the western region of Saudi Arabia to investigate the awareness and knowledge of OSA. A total of 500 participants took part in this study, and the findings revealed a concerning lack of awareness and knowledge among the population in the western region. Nonetheless, the authors observed an intriguing trend: female participants demonstrated a higher level of knowledge and awareness about OSA compared to the male participants. Furthermore, individuals working in the healthcare sector exhibited a higher level of knowledge and awareness compared to those who were not.¹⁷

OSA is a potentially life-threatening disorder therefore, delay diagnosis and treatment may increase level of mortality rate.^{2,4,10} According to BaHammam's study, the incidence of OSA in older persons is relatively higher which is suggested probably due to the physiological and physical changes brought on by aging.²⁰ Al-Rasheedi conducted another interesting study that focus primarily on primary care physician (PCP). Basically, the authors designed the study to evaluate knowledge and attitude of PCPs towards OSA. This study utilized valid and reliable survey. Interestingly, the level of the knowledge and attitude towards OSA was low, this led the authors to suggest increasing awareness among PCPs through continuing medical education.²¹

It was obvious from the current information in the literature, there is a notable lack of awareness and knowledge about OSA among the general population, particularly in Saudi Arabia.^{17-19,22-25} This knowledge gap is critical, as increased awareness and understanding of OSA are essential for early diagnosis, effective management, and reduction of the associated health and economic burdens. However, the majority of this studies focused on specific populations and utilized questionnaire to evaluate both awareness and knowledge. Understanding family awareness is crucial, as families play a significant role in supporting patients and encouraging adherence to treatment, ultimately improving patient outcomes and quality of life. Consequently, the aim of this phenomenological study is to explore extensively the knowledge and awareness of patients' families towards OSA, highlighting the significance of family support in improving diagnosis, management, and patient outcomes.

Materials and Methods

Study Design

This study employed a phenomenological research design, it is a qualitative research approach that focuses on understanding the essence of human experiences from the perspective of those who have lived them. This design is reflective and inductive, allowing researchers to gather rich, detailed data that reveal the meanings and insights participants attach to their experiences.²⁶ The aim of this design is to gain insightful in-depth information about lived experiences of patients' family's towards OSA.

Operational Definitions

Hypopnea: It is defined as a 4% decrease in blood oxygen saturation.^{2,8}

The Apnea-Hypopnea Index (AHI): It is the sum of the number of apneas and hypopneas per hour of sleep, is commonly used to measure the presence and severity of OSA.⁸

Participants and Recruitment Strategy

A purposeful and criterion sampling technique was used to recruit participants that met the inclusion criteria: 18 years old and above, and an individual who has a family member suffering from OSA. Purposeful sampling involves the selection of participants with specific relevant characteristics to ensure rich and pertinent data.²⁶ Criterion sampling further refines this by setting specific inclusion criteria that participants must meet, in this case, having a family member with OSA.²⁶ This method ensures that participants have direct and relevant experiences to share.

The pre-screening survey was sent to all sleep centers in Saudi Arabia. Their permission was granted to distribute the survey among their patients. The patients helped us to nominate one of their family members to complete the survey. In addition, a social media platform was utilized to identify an individual who met the inclusion criteria. To increase demographic diversity, we ensured to reach out to various regions within Saudi Arabia, encompassing both urban and rural areas, and included participants from different socioeconomic backgrounds, educational levels, and ages. This approach aimed to capture a wide range of experiences and perspectives. Upon approval, the participants were asked to attend individual interviews via zoom. Indeed, once the data provided a sufficient description of the explored phenomena, the recruitment strategy was stopped immediately.

Ethics, Consent, and Permissions

At the time of recruitment, the study objectives were explained clearly and coherently to the participants. The participants' names were not used during the interview to ensure confidentiality. The informed consent included publication of anonymized responses was obtained from all participants prior to the interview conduct otherwise, the interview will be postponed. The guidelines in the Declaration of Helsinki were followed to ensure the ethical standards of this study. Participants were informed to have the right to withdraw from the study at any time without prejudice. In addition, the participants were informed that the study is purely for academic purposes and potentially benefits the scholar community.

Institutional Review Board (IRB)

The IRB committee of King Saud bin Abdulaziz University for Health Sciences approved this study (SP21J/100/03).

Interview Outline

The interview questions were carefully constructed in consultation with field experts and based on previous literature to ensure relevance and comprehensiveness.^{16,19–25,27} We utilized a multi-step process to develop and validate the interview guide. Initially, a draft set of questions was created based on literature reviews and input from experts in the field of sleep disorders. This draft was then refined through several rounds of feedback from these experts to ensure clarity and relevance. Some questions were adapted from validated instruments used in previous studies, while others were specifically developed to explore the unique context of family experiences with OSA.^{16,19–25,27} These questions aimed to extract the individuals' experiences with OSA in terms of knowledge, awareness, challenges, coping strategies, and obstacles they faced. (Table 1). The Delphi method is utilized to reach 80% agreement for face and content validity for each question.²⁸

Table 1 Interview Questions

What do you know about sleep-related disorders?
Please describe your level of knowledge regarding obstructive sleep apnea and its relationship with snoring?
What are the challenges that you faced dealing with a family member who has OSA?
How does that affect your life?
What are your coping strategies?

Abbreviations: OSA, Obstructive sleep apnea; CPAP, Continuous Positive Airway Pressure; AHI, Apnea-Hypopnea Index; SDB, Sleep-Disordered Breathing; OHS, Obese Hypoventilation Syndrome.

Data Collection

Data were collected between August and December 2021. Phase 1 at beginning of the interview, the participants were informed that interview will be recorded. In addition, the participants were also notified regarding the objective of the study, and they were given the option to withdraw at any point without facing any negative consequences. The method has been used during the interview was semi-structured to help for providing rich data about an individual's experience.²⁶ The interview for an individual lasted approximately around 30 min. Interviews were carried out by two authors, none of them had prior relationships with the participants. Participants' names were replaced with pseudonyms in all work products related to the study. At the end of the interview, each participant is courteously invited to share any additional thoughts. Phase 2: Two authors [ZN, RH] held regular meetings after each interview to conduct thematic analysis, identify key themes relevant to the study, and discuss their reflections to demonstrate reflexivity.

Data Analysis

The audio recordings were transcribed verbatim. Audio recordings were reviewed extensively by two authors [ZN, RH] to ensure credibility and trustworthiness. The verbatim transcription was obtained in Arabic due to the native language of the participants. Then transcript was translated into English for analysis. Two independent bilingual translators are hired to conduct back translation. Finally, a panel of experts is established to agree on the final translation version.

At the end of the data collection process, thematic analysis was started which followed several systematic steps to ensure rigor and depth in the analysis. First, the authors familiarized themselves with the data by repeatedly reading the transcripts to gain a comprehensive understanding of the participants' experiences. Next, the authors [ZN, RH] independently reviewed the transcripts to generate a preliminary codebook using NVivo 12 Pro. Several meetings were held between the two authors to review their codebooks. The purpose of these meetings was to continuously compare their coding in order to ensure inter-coder reliability. In the end, a final version of the codebook was established. The final codes were then organized into potential themes, collating them into broader categories that captured significant patterns in the data. All identified themes were discussed with all research members to reach a consensus, resolving any discrepancies through discussion and re-evaluation of the data. To validate the findings, preliminary themes were shared with a subset of participants to ensure the themes resonated with their experiences and were accurately represented. The aim of this validation process is to establish member checking.²⁶ Finally, the refined themes were approved by all research members, ensuring robustness and comprehensiveness. This process helps the authors to come up with themes that are approved by all the research members. In addition, the emerging themes were also shared with the external consultant to evaluate the process and findings of this study.²⁶

Results

In this study, out of the twenty-eight participants interviewed, 20 identified as female and 8 identified as male. The educational background of the participants varied significantly, with 8 holding a high school diploma, 13 holding a bachelor's degree, 4 having a master's degree, and 3 possessing a doctorate degree. It was also found that 13 of the females were married, while the rest were single. In contrast, 7 of the males were married and only 1 was single. Furthermore, the economic family status of the participants revealed that 30 were classified as middle class, while 4 were categorized as high class and 2 were identified as low class (Table 2). All of them were suitable based on the inclusion criteria of the study.

The findings are classified into two main themes: family members' knowledge and awareness of OSA, and The multifaceted experience of living with OSA patients. The theme of family members' knowledge and awareness of OSA was divided into two subthemes: lifestyle habits, and knowledge and awareness in society (Table 3). The theme of the multifaceted experience of living with OSA patients was divided into five subthemes: accompanying symptoms, debilitating conditions, difficulties with CPAP, suffering and fear, and coping techniques (Table 4). The purpose of this categorization is to provide a clearer understanding of the families' knowledge and awareness of OSA and its broader effects (Figure 1).

Table 2 Demographic Characteristics of the Participants

		N (%)
Gender	Male	8 (28.6)
	Female	20 (71.4)
Age Group	18–28	11 (39.3)
	29–39	6 (21.4)
	40–50	4 (14.3)
	Above 50	7 (25)
Marital Status	Married	17 (60.7)
	Single	11 (39.3)
Education	High school	8 (28.6)
	Bachelor	13 (46.4)
	Master	4 (14.3)
	Doctorate	3 (10.7)
Income Status	Low	2 (7.1)
	Middle	22 (78.6)
	High	4 (14.3)

Table 3 Family Members' Knowledge and Awareness of OSA

Theme	Representative Participants' in vivo Responses	Frequency
Lifestyle habits	"At the beginning of his sleep he woke up as someone was choking him, he woke up and took deep breaths (describing the sound of his breath) it's like he gasped a lot." (P106) "Snoring happens because of obesity or habits because my uncle smokes. It is the person's habits that can cause the problem." (P118)	27
Knowledge and Awareness in Society	"Maybe as with raising awareness about hypertension diabetes and kidneys we should dedicate a day for sleep apnea like volunteering and raising awareness in malls and among people". (P67) "Making events in public places will help conferences or training courses as an introduction to these matters. These things may can educate the community a little". (P103)	26

Table 4 The Multifaceted Experience of Living with OSA Patients

Theme	Representative Participants' in vivo responses	Frequency
Accompanying Symptoms	"She snores loudly not always just if she is tired. However, her snoring is not like a normal person's." (P115) "We currently don't let him drive because even while he is driving, he may sleep. I mean he may be sitting with us and we have guests or sitting together without guests suddenly he sleeps suddenly we wake him up because his sleep position is not good." (P87) "My grandmother needed to stay in the hospital for about two weeks because she was dizzy and lost consciousness. Because of shortness of breath flu mucus and phlegm her airway was blocked". (P66)	25
Debilitating conditions	"... I took him to the hospital and they said he had thyroid". (P86) "She has Prader-Willi syndrome. She is extremely obese and retardation and she has been learning disabilities. She suffered from cramps previously and her feeding was through a gastric tube. After three years they expected that she had sleep apnea because she was always exhausted while she was sleeping and she woke up in a bad temper". (P111)	22

(Continued)

Table 4 (Continued).

Theme	Representative Participants' in vivo responses	Frequency
Difficulties With CPAP	<p>"Especially when he wakes up and sees signs of the marks on his forehead and around his eyes that's why he sometimes does not use it at night before his work." (P76)</p> <p>"He always uses the device while sleeping to avoid apnea and we are sticking to it. Therefore, he wears the mask of the device then he sleeps....there is a huge change in his condition before and after visiting the doctor and using the device" (P16)</p>	22
Suffering & Fear	<p>"One of the changes was we banned him from driving and we brought a driver for him. Moreover, we tried to make a healthy diet for him. Someone must be with him to take care of him and make sure that he takes his medication on time". (P16)</p> <p>"Look since she encounters difficulties during sleep at night. During the day her morals become a little bad. She becomes a little angry so I feel this thing has affected our lives". (P115)</p>	19
Coping Techniques	<p>"The problem is the snoring we are both suffering from it and sometimes the sound reaches out the living room. So, I started to adapt to it and I have to be beside him to wake him up if he is suffocated". (P76)</p> <p>"I understood that when he used the device and woke up the next day, he told you metaphorically that life was different. I felt happy". (P83)</p> <p>"My father must lose a lot of weight in order to begin the treatment plan after which we can try to find other ways to solve the issue". (P87)</p>	26

Family Members' Knowledge and Awareness of OSA Theme

This theme investigated the level of understanding and awareness among families concerning OSA, with a particular emphasis on lifestyle habits and the broader societal comprehension of the condition.

Lifestyle Habits

The prevalence of obesity was high and increasing, making it a serious threat to public health. Almost all of the interviews conducted pointed towards obesity as a major reason for sleep apnea. Families of patients were aware that lifestyle habits, such as obesity, affect the risk of developing OSA, with 96.4% of respondents acknowledging this. Most individuals who suffer from sleep-disordered breathing snore, and overweight individuals are much more likely to snore. The participants noticed their loved one snoring loudly and choking when he or she tended to sleep on his or her back.

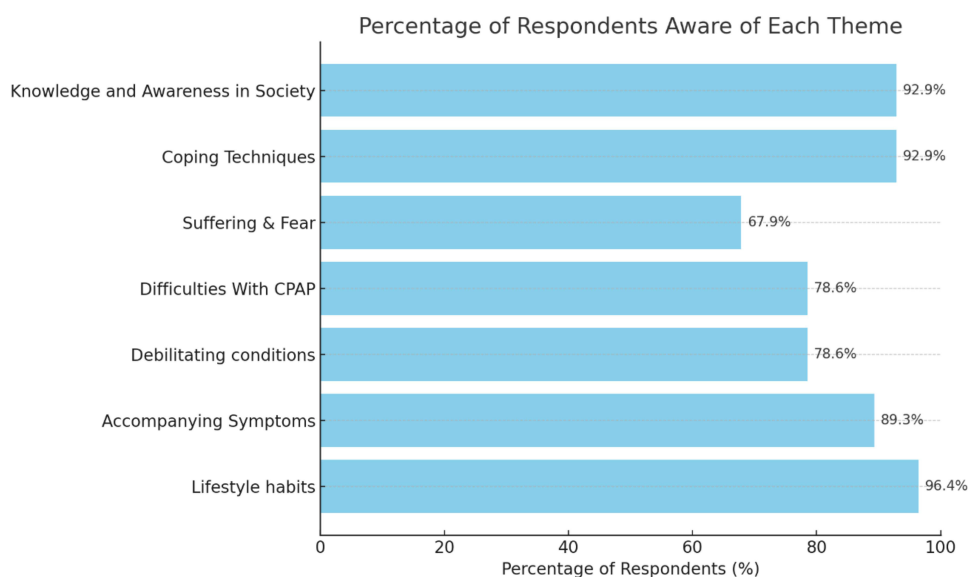


Figure 1 Percentage of respondents aware of each theme.

(P106): At the beginning of his sleep, he woke up as someone was choking him, he woke up and took deep breaths (describing the sound of his breath), its like he gasped a lot.

More than half of the participants discussed how certain lifestyle factors, such as tobacco use, can exacerbate sleep patterns.

(P118): Snoring happens because of obesity or habits because my uncle smokes. It is the person's habits that can cause the problem.

Knowledge and Awareness in Society

The participants noted that most people were unaware of sleep disorders unless they had family members with diagnosed cases. Some felt that these disorders were not considered life-threatening until they spoke to their family physician. The majority of the participants agreed on the need for public awareness campaigns to educate the community about obstructive sleep apnea.

(P67) showed that Maybe as with raising awareness about hypertension, diabetes, and kidneys, we should dedicate a day for sleep apnea, like volunteering and raising awareness in malls and among people.

The participants recommended that utilizing technology would be beneficial for increasing awareness among society.

Making events in public places will help, conferences or training courses as an introduction to these matters. These things may can educate the community a little. Said By (P103)

The Multifaceted Experience of Living with OSA Patients Theme

This theme explored the impact of OSA awareness on families, including the OSA symptoms, related medical conditions, patient refusal to use CPAP, and effective coping strategies to overcome OSA.

Accompanying Symptoms

Participants reported various symptoms associated with OSA, such as interrupted sleep, waking up tired, heavy snoring, sudden awakenings during the night, and excessive daytime sleepiness. Common symptoms reported by respondents include interrupted sleep, waking up tired, heavy snoring, and sudden awakenings during the night, feeling lazy and lethargic throughout the day, fatigue, drowsiness, headaches, falling asleep while sitting, difficulty concentrating, and shortness of breath.

One participant noted,

(P115): She snores loudly not always just if she is tired. However, her snoring is not like a normal person.

(P66) mentioned, My grandmother needed to stay in the hospital for about two weeks because she was dizzy and lost consciousness. Because of shortness of breath, flu, mucus, and phlegm, her airway was blocked.

Over half of the participants mentioned experiencing daytime symptoms. These included observing that their family members were lethargic during the day, experiencing excessive daytime sleepiness, struggling with daily activities, having difficulty focusing, and experiencing mood changes such as irritability or depression.

One participants said,

(P87): We currently don't let him drive because even while he is driving, he may sleep. I mean he may be sitting with us, and we have guests or sitting together without guests, suddenly he sleeps, suddenly we wake him up because his sleep position is not good.

Debilitating Conditions

Participants observed various conditions linked to OSA, such as thyroid issues, Prader-Willi syndrome, hypertension, heart disease, and stroke, caused by recurrent drops in blood oxygen levels. Additionally, some observed an increase in their patients' weight.

One participant clarified,

(P86): I took him to the hospital, and they said he had thyroid issues.

Another respondent shared,

(P111): She has Prader-Willi syndrome. She is extremely obese, has retardation, and has learning disabilities. She suffered from cramps previously, and her feeding was through a gastric tube. After three years, they expected that she had sleep apnea because she was always exhausted while she was sleeping, and she woke up in a bad temper.

Participants described how these conditions deteriorate with OSA.

(P70): My husband has a history of asthma, and unfortunately, it worsens while he is sleeping.

Difficulties with CPAP

The participants unequivocally expressed concerns about CPAP therapy, citing challenges with mask fit, discomfort, and side effects such as shortness of breath. Despite recognizing the importance of CPAP in reducing OSA symptoms during the day, they faced difficulty persuading their patients to adhere to the therapy at night.

One respondent mentioned:

(P76): Especially when he wakes up and sees signs of the marks on his forehead and around his eyes, that's why he sometimes does not use it at night before his work.

On the other hand, some participants initially faced resistance from their patients in using CPAP; however, after a few nights, patients adhered to CPAP when they saw improvement in their conditions.

One respondent mentioned:

(P16): He always uses the device while sleeping to avoid apnea and we are sticking to it. Therefore, he wears the mask of the device then he sleeps...there is a huge change in his condition before and after visiting the doctor and using the device

Suffering & Fear

Participants expressed that OSA affects not just the patient but the entire family, causing stress, fear, and lifestyle changes. 67.9% of respondents highlighted the impact of OSA on family dynamics and emotional well-being. During interviews, respondents highlighted that if a family member is diagnosed with sleep apnea, not only does he/she suffer from it, but so does the entire family.

One respondent mentioned:

(P16): Someone must be with him to take care of him and make sure that he takes his medication on time.

The participants discussed the impact that having a family member diagnosed with OSA has had on their lives. They mentioned that their lives have been dramatically affected due to concerns for their loved one's well-being. They also spoke about the challenges of not being able to leave their family member alone all the time and coping with their mood swings and changes in behavior.

One respondent mentioned:

(P115): Look, since she encounters difficulties during sleep at night. During the day her morals become a little bad. She becomes a little angry, so I feel this thing has affected our lives.

Coping Techniques

Participants discussed various coping strategies, such as adapting to snoring, managing the patient's behavior, modifying lifestyle, and providing support for CPAP usage. Specifically, the participants commented on the consequences of not encouraging their patients to use CPAP.

Another participant revealed

(P83): I understood that when he used the device and woke up the next day, he told me metaphorically that life was different. I felt happy.

The participants agreed that the snoring was bothersome in their relationships, but they endured it out of necessity due to the patient's condition and the need to be close enough to wake them if they experienced breathing difficulties.

One participant mentioned:

(P76): The problem is the snoring, we are both suffering from it, and sometimes the sound reaches out the living room. So, I started to adapt to it and I have to be beside him to wake him up if he is suffocated.

The participants concurred that implementing changes in their lifestyles, particularly by improving their food habits, to motivate their patients to lose weight, will indeed improve OSA.

One participant mentioned:

(P87): My father must lose a lot of weight in order to begin the treatment plan, after which we can try to find other ways to solve the issue.

Another noted:

(P117): I supported my husband in changing his lifestyle by giving up some of my favorite foods.

Discussion

To our knowledge, this is among the first studies to employ qualitative methods to describe the level of awareness and knowledge of patients' families on OSA in Saudi Arabia. The finding of this study demonstrates an inadequate level of knowledge around OSA, which aligns with current information in the literature.^{17,18,29} This study identified several key knowledge gaps related to health literacy and OSA. These includes lifestyle habits to reduce OSA risk, understanding of OSA, recognition of severity of OSA symptoms, importance of medical intervention, understanding the realm of comorbid conditions associated with OSA, practical difficulties and non-compliance issues with CPAP therapy, family dynamics and emotional well-being associated with OSA, and available resources for coping with OSA.

Some participants noticed that changing lifestyles posed a challenge when dealing with their patients. For instance, they observed that obesity significantly contributes to the prevalence and severity of OSA, as excess fatty tissues interfere with breathing by reducing chest capacity. This observation aligns with the findings of Wali et al, which reported that while obesity is acknowledged as a major risk factor for OSA in a Saudi Arabian population, interventions often fail to address a comprehensive lifestyle modification which includes other risk factors other than obesity.¹⁶ These findings collectively emphasize the importance of addressing obesity through targeted lifestyle modifications to mitigate the risk and severity of OSA.

Moreover, the study found that respondents had a limited understanding of the complications associated with untreated obstructive sleep apnea (OSA). Alshehri et al also noted a significant knowledge gap in OSA management and treatment in the Asir region, indicating a crucial need for comprehensive awareness programs.²⁵ Internationally, Tuomilehto et al demonstrated that a lifestyle intervention focused on weight reduction and physical activity resulted in sustained improvements in OSA symptoms, underscoring the importance of managing body weight.³⁰ Raising awareness among the general population about the benefits of lifestyle modifications through weight loss programs is vital in preventing the exacerbation of OSA.^{18,25,31} These findings emphasize the necessity for more structured educational initiatives.^{25,30}

According to our study, most respondents were able to recognize common symptoms such as loud snoring, interrupted sleep, and excessive daytime sleepiness in their patients. This level of basic awareness is consistent with the findings of Bartolucci et al, who reported that a majority of their respondents were knowledgeable about OSA symptoms but lacked a deeper understanding³². Despite this basic knowledge of symptom recognition, the respondents lacked awareness of the severe health implications. This aligns with the findings from the Al-Baha region in Saudi Arabia, where knowledge was found to be insufficient and influenced by education and family history¹⁸. Similarly, Alosaimi et al in Jeddah found that only 16% of parents had a good knowledge of pediatric OSA, often missing symptoms such as bedwetting and hyperactivity.¹⁹ On a global level, a study in Singapore revealed poor public knowledge about OSA, further emphasizing the need for effective health education.²⁹

The recent study revealed significant gaps in the respondents' understanding of the comorbid conditions associated with OSA. This finding is consistent with Huang et al, who used data mining to uncover a comprehensive pattern of comorbid conditions related to OSA, such as hypertension, obesity, and type 2 diabetes, highlighting the intricate interactions and the necessity for improved education.³ Additionally, some respondents also mentioned a worsening of OSA with other conditions such as asthma. This may be due to the fact that these conditions lead to airway obstruction, resulting in breathing difficulties during sleep. This is similar to the findings by Anker et al, who studied sleep-disordered breathing and cardiovascular disease and reported that certain chronic conditions such as asthma contributed to OSA.³³

The respondents in the current study encountered significant challenges when using CPAP therapy with their patients, primarily due to mask discomfort and side effects such as shortness of breath and nasal congestion. These findings are consistent with those of McEvoy et al, who also identified similar issues affecting CPAP adherence stemming from discomfort and side effects. This underscores the importance of providing better education and support.³⁴ Labarca et al further emphasized that adherence is often compromised by side effects and discomfort, highlighting the need to prioritize efforts in improving patient compliance.³⁵

In our study, the majority of participants recognized the emotional and practical impacts they experienced when adapting to a new lifestyle to care for their patients. They reported feelings of fear and stress. This finding aligns with a study conducted in Saudi Arabia. For example, Alghamdi et al found insufficient awareness of the effects of OSA on family dynamics in the Al-Baha region.¹⁸ Similarly, Yaqoub et al reported poor knowledge about the complications of OSA in the Jazan region, emphasizing the need for enhanced public education.²³ It is essential for patients and their family members to adapt quickly to avoid potential complications such as depression, decreased productivity at work, and an increased risk of accidents.^{5,19,25,27,36}

Recommendations

Future education programs should focus on culturally relevant materials and community-based awareness campaigns. These programs should develop bilingual educational materials and utilize diverse media platforms to ensure wide dissemination. Community engagement through local events, malls, and healthcare centers, involving local influencers and healthcare professionals, will enhance the reach and impact of these campaigns. Family-centered workshops should provide practical information on managing OSA, treatment adherence, and coping strategies, while primary healthcare providers should be trained to recognize OSA symptoms and educate patients during routine visits. Digital health platforms, including mobile applications and online resources, can offer educational content, symptom trackers, and CPAP therapy reminders, with features for virtual consultations. Regular assessments through surveys should measure knowledge levels and identify gaps.

Ongoing research and feedback mechanisms will help evaluate the effectiveness of these programs. Collaborations with schools and workplaces can further extend education efforts, emphasizing the importance of sleep health. These tailored education programs and knowledge measurement tools aim to improve OSA awareness and management, leading to better health outcomes for patients and their families in Saudi Arabia.

Strengths and Limitations

This study is considered a phenomenologically oriented study, which inherently limits the generalizability of its findings. The goal was to create an in-depth understanding of individuals' lived experiences rather than to produce broadly

applicable results. In addition, most participants were female, either complaining about snoring or caring for a loved one with OSA. Furthermore, all the participants shared similar ethnic backgrounds. Thus, future studies need to include larger and more diverse samples to enhance the representativeness of the findings. Additionally, the study's reliance on qualitative methods, rather than quantitative analysis, introduces potential biases related to interpretation and analysis by the researchers. This means that the research was open to interpretation and analysis via the researchers. The translation process into English also poses a limitation, as nuances and cultural contexts may have been lost or altered during translation. Factors such as financial difficulties, family conflicts, and the presence of other ongoing medical conditions among family members were not quantitatively assessed but may significantly influence the knowledge and awareness of OSA and its management.

Despite these limitations, the study has several strengths. The phenomenological approach allowed for an in-depth exploration of participants' experiences and perceptions, providing rich, detailed insights into the impact of OSA on families. The use of semi-structured, in-depth interviews facilitated a comprehensive understanding of the challenges, coping strategies, and emotional impacts associated with managing OSA in a family context. This method also enabled participants to express their thoughts and feelings freely, leading to the identification of several themes that are critical for understanding the familial aspect of OSA awareness and management. Moreover, the rigorous process of data collection and analysis, including the use of bilingual translators and thematic validation, ensured the credibility and trustworthiness of the findings. These strengths highlight the study's contribution to the qualitative understanding of OSA and underscore the importance of considering family dynamics in OSA management.

Conclusion

Our study found that there is critical gap in knowledge and awareness about OSA among patients' families in Saudi Arabia. The results show that although participants acknowledge obesity and lifestyle choices as important contributors to OSA, their knowledge of symptoms, risk factors, health effects, and available treatments was limited. The insufficient understanding of lifestyle adjustment, symptoms associated, complications and challenges with CPAP therapy, emotional effect, coping mechanism, and social awareness are among the major themes that have been found. Many families struggling with CPAP therapy due to discomfort and side effects. These findings underscore the critical need for comprehensive public awareness campaigns, education, and support systems to improve understanding and management of OSA. The low level of knowledge suggests that many cases may remain undiagnosed and untreated, leading to severe health issues and emotional stress for families. Improving awareness and providing better support systems could lead to earlier diagnosis, better management, and improved health outcomes for OSA patients and their families.

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Disclosure

The authors report no conflicts of interest in this work.

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